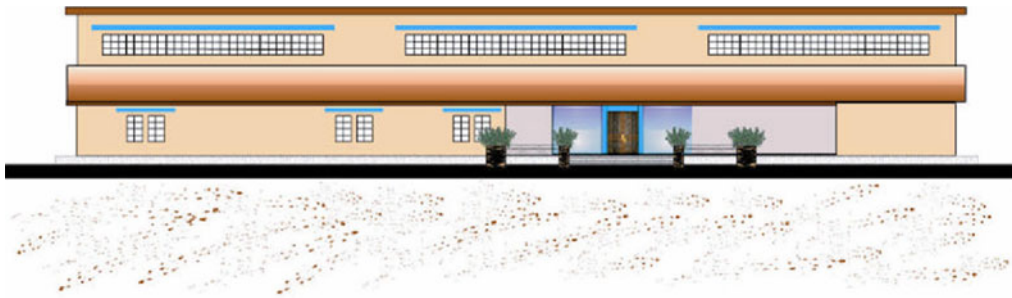

TULAROSA BASIN DESALINATION RESEARCH FACILITY FINAL ENVIRONMENTAL ASSESSMENT



**U.S. Department of the Interior
Bureau of Reclamation
Technical Service Center
Denver, Colorado**

July 2003

**The mission of the Department of the Interior is
to protect and provide access to our Nation's
natural and cultural heritage and honor our trust
responsibilities to Indian tribes and our
commitments to island communities.**

**The mission of the Bureau of Reclamation is to
manage, develop, and protect water and
related resources in an environmentally and
economically sound manner in the interest of
the American public.**

FINDING OF NO SIGNIFICANT IMPACT

Tularosa Basin Desalination Research and Development Facility

U.S. Department of the Interior
Bureau of Reclamation
Commissioner's Office
Research and Natural Resources

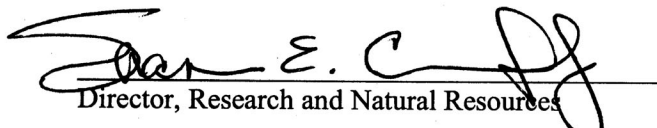
The Bureau of Reclamation (Reclamation) has prepared an environmental assessment (EA) on its proposal to construct and operate the Tularosa Basin Desalination Research and Development Facility (Research Facility) in Otero County, New Mexico. A copy of the final EA is attached to this Finding of No Significant Impact (FONSI).

The issues evaluated in the EA were identified through an early public and agency scoping process conducted by Reclamation and other members of the Executive Committee. The scoping process received project input through meetings and discussions with key stakeholders and local, State, and Federal agency personnel. Site visits, surveys, and consultations and discussions with the U.S. Fish and Wildlife Service and the New Mexico State Historic Preservation Office were also used to identify issues.

The EA specifically evaluated the impacts of the construction and operation of the 30-acre Research Facility at three alternative sites on ground and surface water hydrology and quality, cultural resources, Indian Trust Assets, vegetation, wildlife, threatened and endangered species, and air quality. Construction and operation activities will have only potentially minor and, in some cases, temporary impacts on ground water quality, vegetation, wildlife, and air quality. There will be no impact on ground water hydrology, cultural resources, Indian Trust Assets, and threatened and endangered species.

The EA identified and incorporated into the proposed project several measures to reduce or eliminate impacts or potential impacts on the environment. These measures are included in Appendix A of the attached Tularosa Basin Desalination Research and Development Facility Final EA.

Based on an analysis of the environmental impacts and implementation of the measures, as shown in the attached Tularosa Basin Desalination Research and Development Facility Final EA, Reclamation has concluded that implementation of Alternative B (Preferred Alternative) will not have a significant impact on the quality of the human environment or the natural and cultural resources of the area. This FONSI documents environmental review and evaluation in compliance with the Council on Environmental Quality's regulations for implementation of the National Environmental Policy Act of 1969, as amended.


Director, Research and Natural Resources

7-18-2003
Date

TULAROSA BASIN DESALINATION RESEARCH FACILITY FINAL ENVIRONMENTAL ASSESSMENT

**U.S. Department of the Interior
Bureau of Reclamation
Technical Service Center
Denver, Colorado**

July 2003

Acronyms and Abbreviations

AFB	Air Force Base
BIA	Bureau of Indian Affairs
BGD	billion gallons per day
BMPs	Best Management Practices
City	city of Almogordo
County	Otero County
EA	environmental assessment
gpm	gallons per minute
ITAs	Indian Trust Assets
MGD	million gallons per day
NEPA	National Environmental Policy Act
ppm	parts per million
Reclamation	Bureau of Reclamation
Report	<i>Report to Congress: Tularosa Basin National Desalination Research Facility Study</i>
Research Facility	Tularosa Basin Desalination Research Facility
Sandia	Sandia National Laboratories
SEC Plan	Soil Erosion Control Plan
Service	U.S. Fish and Wildlife Service
SHPO	New Mexico State Historic Preservation Office
TDS	total dissolved solids
°F	degrees Fahrenheit
%	percent

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PURPOSE AND NEED FOR ACTION

The U.S. Senate Report 107-39 (accompanying S. 1171 Energy and Water Development Appropriation Bill) directed the Bureau of Reclamation to evaluate the feasibility of establishing a desalination research facility in the Tularosa Basin of New Mexico.

Reclamation prepared this environmental assessment (EA) to evaluate the impacts of the proposed construction and operation of the Tularosa Basin Desalination Research and Development Facility (Research Facility). This EA has been prepared to inform decisionmakers and the public of the impacts associated with each of the action alternatives. The focus of the evaluation is the issues and concerns identified by the public and resource agencies during scoping.

PROPOSED ACTION

Reclamation proposes to construct a Desalination Research Facility in the Tularosa Basin, Otero County, in south central New Mexico.

PURPOSE

The proposed Research Facility would provide a means for improving and investigating existing desalination technologies, as well as new water purification technologies to increase the quantity and quality of existing water supplies. Its focus would be on issues associated with treatment of inland brackish ground water.

NEED

The supply of freshwater is an increasingly critical national and international issue. At current use rates, it is projected that, by 2025, the world will require 20 percent (%) more water for agriculture, 40% more water for urban uses, and 40% more water for power generation. Severe water-related stress due to pollution, scarcity of water, population growth, competing demands, and lack of coordinated management presents a major challenge to many regions of the United States.

There are several challenges facing desalination in inland areas. Concentrate disposal is a major obstacle for inland desalination because of the limited options to dispose of salts. This area of research would be the primary focus of the proposed Research Facility.

BACKGROUND

Considerable effort has been devoted to desalination technology research, development, and implementation over the past 50 years. Those efforts have led to significant improvements in the cost and performance of desalination technologies. However, further improvements are required to expand the use of desalination and related water purification technologies.

Today, there are over 12,000 desalination plants in operation in the world, generating over 5 billion gallons per day (BGD) of freshwater. This accounts for only 1% of the world's drinking water supplies. The cost of brackish water desalination now ranges from \$1.50 to \$2.00 per 1,000 gallons for a plant capacity of about 3-5 million gallons per day (MGD). These costs vary depending on plant size, water collection system, water quality, salt or concentrate disposal cost, and energy cost. Desalination costs of inland systems are often two or more times higher than these averages due, in part, to concentrate disposal costs.

In the next 20 years, the desalination industry estimates that over \$70 billion will be invested worldwide in designing and building new desalination plants and facilities. This will add an additional 10 BGD in freshwater capacity, doubling the amount of freshwater generated by desalination to about 2% of the world's daily use in 2020.

From these industry projections, it is clear that new or revolutionary approaches or “next generation” concepts for desalination technology must be developed to enable desalination to significantly improve the use of available saline and brackish waters. Though desalination technology cost and performance have been significantly improved over the past 30 years, overall desalination system total-life-cycle costs still need to be reduced by a factor of 3-10, depending on the treated water use or application, to produce more affordable desalination-treated water.

SCOPING AND ISSUES

In January 2002, Reclamation organized an Executive Committee to oversee the planning of the Research Facility. The Executive Committee consists of Federal and State water agencies and groups including Reclamation, Sandia National Laboratories (Sandia), the United States Geological Service, the New Mexico State Engineers Office, and the New Mexico Water Resources Research Institute. Table 1-1 lists the members of the Executive Committee.

After assessing several options for hosting the Executive Committee meetings and providing public access to information on the progress of the Research Facility study, the New Mexico Water Resources Research Institute (WRRI) at New Mexico State University was selected to host the Executive Committee meetings and distribute and disseminate information on the facility study. The WRRI provided a well-known, neutral, and easily accessible venue for the Executive Committee as well as the public to

Table 1-1.—Executive Committee Members

Name	Affiliation	Technical Expertise
Mike Hightower	Sandia National Laboratories Albuquerque, New Mexico 87185	Water Resources Desalination Research
Eddie Livingston	Livingston Associates Alamogordo, New Mexico 88310	Water Resources Desalination Plant Design
Michael Norris	Reclamation - Water Quality Improvement Center Yuma, Arizona 85364	Desalination Research
Lorenzo Arriaga	Reclamation El Paso, Texas 79901	Water Resources
Bobby Creel	Associate Director, New Mexico Water Resources Research Institute Las Cruces, New Mexico 88003	Water Resources Research
Andrea Mendoza	Office of State Engineer Las Cruces, New Mexico 88004	Water Resources and Water Rights
Karl Wood	Director, New Mexico Water Resources Research Institute Las Cruces, New Mexico 88003	Water Resources Research
Tom Jennings	Reclamation, Denver Federal Center Denver, Colorado 80225-0007	Desalination Research Management
Calvin Chavez	Office of State Engineer Las Cruces, New Mexico 88004	Water Resources and Water Rights
Jim Sizemore	Office of State Engineer Albuquerque, New Mexico 87102	Water Resources and Water Rights
Ed Fierro	City of El Paso El Paso, Texas 79925	Water Utilities
Mike Landis	Reclamation El Paso, Texas 79901	Water Resources
Rick Huff	U.S. Geological Survey Las Cruces, New Mexico 88003	Water Resources
Jim Pacheco	Sandia National Laboratories Albuquerque, New Mexico 87185	Renewable Energy
Ian Watson	RosTek Association Tampa, Florida 33647	Desalination Plant Design
Paul Kinshella	City of Phoenix , Water Services Phoenix, Arizona 85003	Water Utilities
Del Holz	Reclamation, Denver Federal Center Denver, Colorado 80225-0007	Environmental Compliance
Bruce Johnson	City of Tucson, Tucson Water Tucson, Arizona 85748	Water Utilities
Signa Larralde	Reclamation Albuquerque, New Mexico 87102	Cultural Resources
Tom Hinkebein	Sandia National Laboratories Albuquerque, New Mexico 87185	Brine Disposal

observe discussions and reviews. The WRRI also had a well-established and maintained web site for posting information on the status and progress of the study.

All the technical information and presentations developed during the facility study was placed on the WRRI web site: <<http://www.wrri.nmsu.edu>>. This included background information on the goals and objectives of the study, information on the roles and mission of a Tularosa Basin facility, presentations given to various groups on the progress of the facility study, Executive Committee meeting minutes, and associated evaluations and reports.

Executive Committee meetings were held in January, March, April, May, July, and August of 2002. Observers attending the various meetings included: Alamogordo City Mayor, City Manager, City Commissioners, local staff of both New Mexico U.S. Senators, and local staff of the U.S. Representative from the Alamogordo area.

Early agency scoping was conducted by the Executive Committee to identify the issues to be addressed in the EA. Information was gathered through meetings and discussions with key stakeholders, and local, State, and Federal agency personnel. Site visits, surveys, and consultations and discussions with the U.S. Fish and Wildlife Service (Service) and the State Historic Preservation Office were also used to identify issues.

In addition, Reclamation and Sandia were on the published agenda of the Alamogordo City Commissioner's meeting on September 24, 2002, to discuss the Research Facility and to seek public input. The meeting was attended by approximately 75 people from the local area. There was general support expressed for the Research Facility. No new issues or concerns were raised by the public.

Issues related to the construction and operation of the Research Facility include the following resources:

- ❖ Ground water hydrology and quality
- ❖ Cultural resources
- ❖ Indian Trust Assets
- ❖ Vegetation
- ❖ Wildlife
- ❖ Threatened and endangered species
- ❖ Air quality

The above issues were considered in the development of the EA alternatives, and these issues are addressed in Chapter 3, "Affected Environment and Environmental Consequences," of this EA.

BRIEF DESCRIPTION OF THE ALTERNATIVES

Three action alternatives (Alternatives B, C, and D) and one no action alternative (Alternative A) were evaluated in the EA. These alternatives are briefly described below.

Alternative A – No Action – The Research Facility would not be constructed or operated.

Alternative B (Site 7) – Reclamation's preferred alternative. The site is located within the boundaries of Alamogordo (City). The City would donate its water rights to the site to the project. The site has easy access for future tours of the Research Facility.

Alternative C (Site 4) – This site is located south of the City on land owned by the State. It has easy access for tours of the Research Facility. Water rights would need to be obtained from the State.

Alternative D (Site 6) – This site is located on private land south of the City. The landowner would donate the site to the project. The site has easy access for future tours of the Research Facility.

Chapter 2 provides additional information on each of the action alternatives.

The EA identified and incorporated into the project several measures to reduce or eliminate impacts or potential impacts on the environment. These measures are included in Appendix A of the EA.

LOCATION AND GENERAL DESCRIPTION OF THE AFFECTED AREA

The study area is located within Otero County in the vicinity of Alamogordo, New Mexico. The area is west of the Sacramento Mountains in the Tularosa Basin.

The Tularosa Basin is comprised of approximately 6,500 square miles, consisting of a narrow intermontane desert valley bounded by block plateaus or gently tilted stratified formations. The basin extends in a southward direction from the southern tip of the Chuparda Mesa in central New Mexico for a distance of about 130 miles to near the New Mexico-Texas State line. The Jicarilla, Sierra Blanca, and Sacramento Mountains form the rim of the basin on the east, a low divide on the south, and the Organ, San Andres, and Oscura Mountains on the west. The interior plain has a low relief with altitudes decreasing from about 4400 feet on the north to 4000 feet on the south.

The Tularosa Basin has an extensive supply of brackish and saline ground water resources. These resources are mostly shallow and lie in a rather permeable aquifer. Within a 5-mile radius, water with salinity from 1,000 parts per million (ppm) total dissolved solids (TDS) to over 100,000 ppm TDS is available. Additionally, a wide range of water chemistries, including sodium chloride, carbonate, and sulfate based brackish waters, are available. This provides a unique opportunity to evaluate desalination technologies over a wide range of natural water qualities at one location.

The study area has a semiarid continental climate characterized by hot summers and mild winters with relatively short spring and fall seasons. The average annual temperature is 61 degrees Fahrenheit (°F). Average annual precipitation in Alamogordo is 9.8 inches, 60% occurring during July, August, and September.

The study area is located within the Chihuahuan desertscrub plant community. Common shrub species in this community include mesquite and creosote bush. Grasses include dropseed, fluff grass, purple three-awn, and black grama. Cholla and prickly pear cacti are abundant in this community. Areas where surface water collects typically contain beardgrass, sideoats gramma, black gramma, windmill grass bush muhly, vine mesquite, foxtail, and cottontop.

Wildlife use within the study area is limited by the disturbed or grazed condition of the ground cover and the proximity of suburban and industrial activities. Common animals that occur in the area include: mammals such as ground squirrel, coyote, and black-tailed jackrabbit; birds such as greater roadrunner, turkey vulture, American kestrel, and morning dove; and reptiles and amphibians such as Chihuahuan spotted whiptail, Texas horned lizard, and western diamondback rattlesnake.

Figure 1-1 shows the general location of the Tularosa Basin. The levels of TDS are also shown for the ground water in the basin. The figure also shows the lack of surface water within the closed Tularosa Basin. There are no perennial streams and very few intermittent streams in the basin.

Purpose and Need for Action

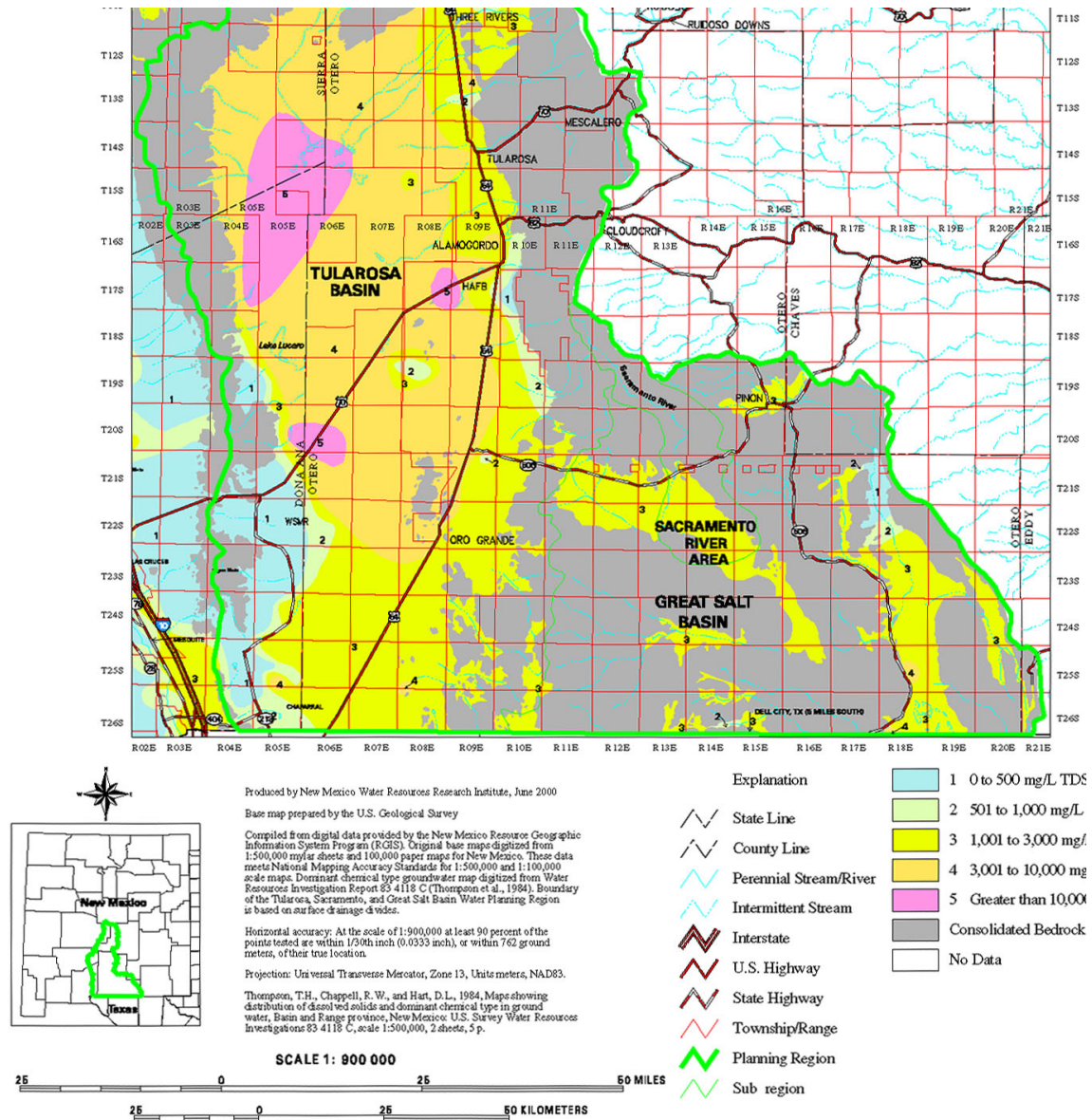


Figure 1-1.—Location of Tularosa Basin.

DESCRIPTION OF ALTERNATIVES

INTRODUCTION

Many of the potential needs and applications for improvements in desalination revolve around inland issues. Inland applications of desalination have some advantages and many disadvantages. One advantage is that the brackish waters available for supplementing inland fresh water resources have significantly lower salinity levels than sea water. Major problems are:

- ❖ Most inland applications are smaller and cannot take advantage of economies of scale like coastal plants.
- ❖ The brackish water chemistries are highly variable and often contain high concentrations of silicates and sulfates that often are problematic for traditional desalination technologies.
- ❖ Disposal of the desalination concentrate is often difficult and very costly.

The United States does not have a desalination research center focused on inland ground water desalination issues, nor is there a research facility directly designed to support evaluation of renewable energy technologies for a broad range of desalination and concentrate disposal applications.

ALTERNATIVES

DEVELOPMENT OF ALTERNATIVE SITES

The development of action alternatives was concerned with evaluating various sites for the construction and operation of the proposed Research Facility, as described below. Criteria were developed to assist in the formulation of site alternatives. These criteria are outlined below.

- ❖ Proximity to a planned Alamogordo Desalination Facility
- ❖ Easy access to saline and brackish waters of approximately 2,000; 7,000; and 15,000 ppm TDS and variable water chemistry, including sulfate based waters
- ❖ Water rights readily obtainable
- ❖ Between 20 and 30 acres of land
- ❖ Facility orientation and design to enable use of solar energy
- ❖ Easy access to major highways for high visibility and easy access

- ❖ Cost of land
- ❖ Proximity to existing utilities

Alternative Site Locations

Seven areas were identified as possible alternative sites for construction and operation of the Research Facility. These sites are listed in table 2-1 below.

Table 2-1.—Alternative Site Locations

Site	Comments
Site 1 – About 15 miles north of Alamogordo	Adjacent to planned City desalination facility, utilities available, water quality probably too good, out of the way for tourists.
Site 2 – Private land south of Alamogordo on White Sands highway	High traffic flow, land offered free by owner, close to airport and City sewage treatment plant, expansion concerns, need water rights and pipeline easements.
Site 3 – Southwest side of Alamogordo	In City limits, water rights donated by City, water reclaim line, high traffic flow, utilities on site. Potential for hazardous waste.
Site 4 – State land south of Alamogordo on White Sands highway	High water variability, low State lease costs, high traffic flow, no utilities for new pipeline easements, need to obtain water rights from State.
Site 5 – Land further southwest and closer to Holloman Air Force Base (AFB)	Similar to Site 4 but closer to Holloman AFB, which may have landing issues if waterfowl take up residence in evaporation ponds.
Site 6 – Private land south of Alamogordo on White Sands highway	High traffic flow, land offered free by owner, limited utilities for new pipeline easements, adjoining property zoning issues, need to obtain water rights from private owner.
Site 7 – Southwest side of Alamogordo	In City limits, water rights donated by City, water reclaim line, high traffic flow, utilities on site, new pipeline easements available on existing utilities.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER STUDY

Site 1, located north of the City, was eliminated from further study because ground water quality and ground water quality variability in this area was not suitable for the Research Facility. Site 2 was eliminated because of its proximity to the City's airport and sewage treatment facility and the concern that odors would be unpleasant for the workers and visitors at the Research Facility. Site 3 was eliminated from further consideration because it was a former waste disposal site and there was a concern for hazardous waste. Site 5 was eliminated due to the potential of the facility ponds attracting waterfowl that could interfere with operations at or near Holloman Air Force Base.

ALTERNATIVES CONSIDERED IN DETAIL

Sites 4, 6, and 7 from table 2-1 were identified for further analysis. These sites are shown in figure 2-1 and are briefly discussed below.

- ❖ Site 7 - A City-owned site in the southwest part of Alamogordo located near the intersection of U.S. Highway 70 and U.S. 54 to El Paso. City utilities for the Research Facility would be readily available at this location. Fire protection would also be easily provided by the City. This site is described in this EA as **Alternative B** and is Reclamation's preferred alternative.
- ❖ Site 4 - State land located adjacent to White Sands Highway. The site is located outside of City limits. Utilities such as electricity and sewage would need to be provided at an additional cost of up to \$1 million. This site is known in the EA as **Alternative C**.
- ❖ Site 6 - Private land, located adjacent to White Sands Highway. The site is located outside of City limits. Utilities such as electricity and sewage would need to be provided at an additional cost of up to \$1 million. This site is described as **Alternative D**.

Pictures of the three alternative sites areas are shown in figure 2-2. An overhead photograph of Alternative B, the preferred location, is shown in figure 2-3. Figure 2-4 shows a schematic of the Research Facility, site plan.

DESCRIPTION OF THE DESIGN AND OPERATION OF THE RESEARCH FACILITY

The proposed Research Facility would have the capabilities to enhance development and test a broad range of alternative technologies, including the ability to conduct pilot-scale research and testing of concepts that:

- ❖ Use renewable energy techniques to reduce desalination costs
- ❖ Are cost effective for small-scale or portable systems
- ❖ Can treat large surface flows at very low cost
- ❖ Address produced water treatment for beneficial use
- ❖ Address environmental concerns of inland desalination concentrate use and disposal

DESIGN, MANAGEMENT, AND OPERATIONAL CRITERIA

Several design, management, and operational criteria were developed for the proposed research facility. These criteria, as described below, are included as part of each of the action alternatives.

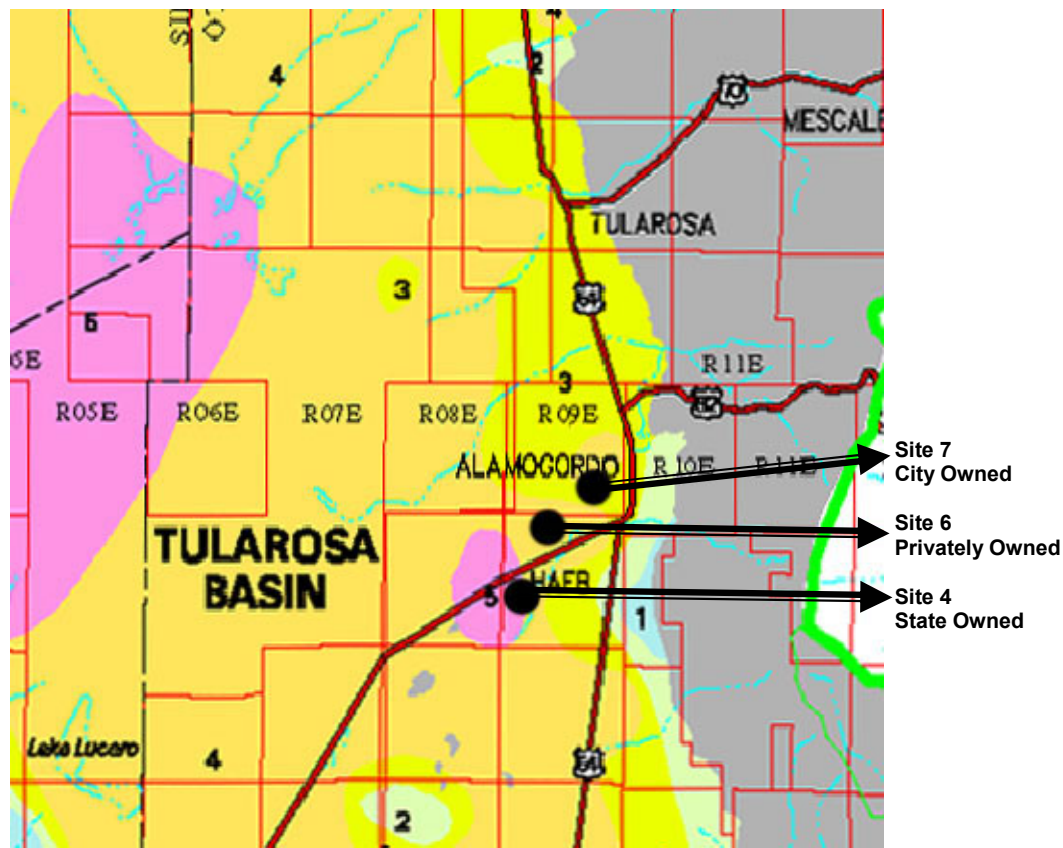


Figure 2-1.—Site locations considered.

Design Criteria

Design criteria were developed to provide the necessary flexibility needed to conduct the research and become a focal point for interacting with the public on the status and capabilities of desalination technologies. The main criteria include:

- ❖ Sufficient office space for a facility manager, engineers and technicians, secretarial and administrative staff, visiting research offices, a resource room, and conference room for technical meetings, tours, and presentations.
- ❖ Experimental space to include a high bay area for multiple research projects, including operation of a desalination system to provide site process water, a control room, and water laboratory, as well as space for larger-scale demonstrations and renewable energy applications.
- ❖ Design layout such that future expansion would be possible and tours can be easily conducted.



Alternative B – Alamogordo-owned site.



Alternative C – State-owned site.



Alternative D – Privately owned site.

Figure 2-2.—Alternative site locations.

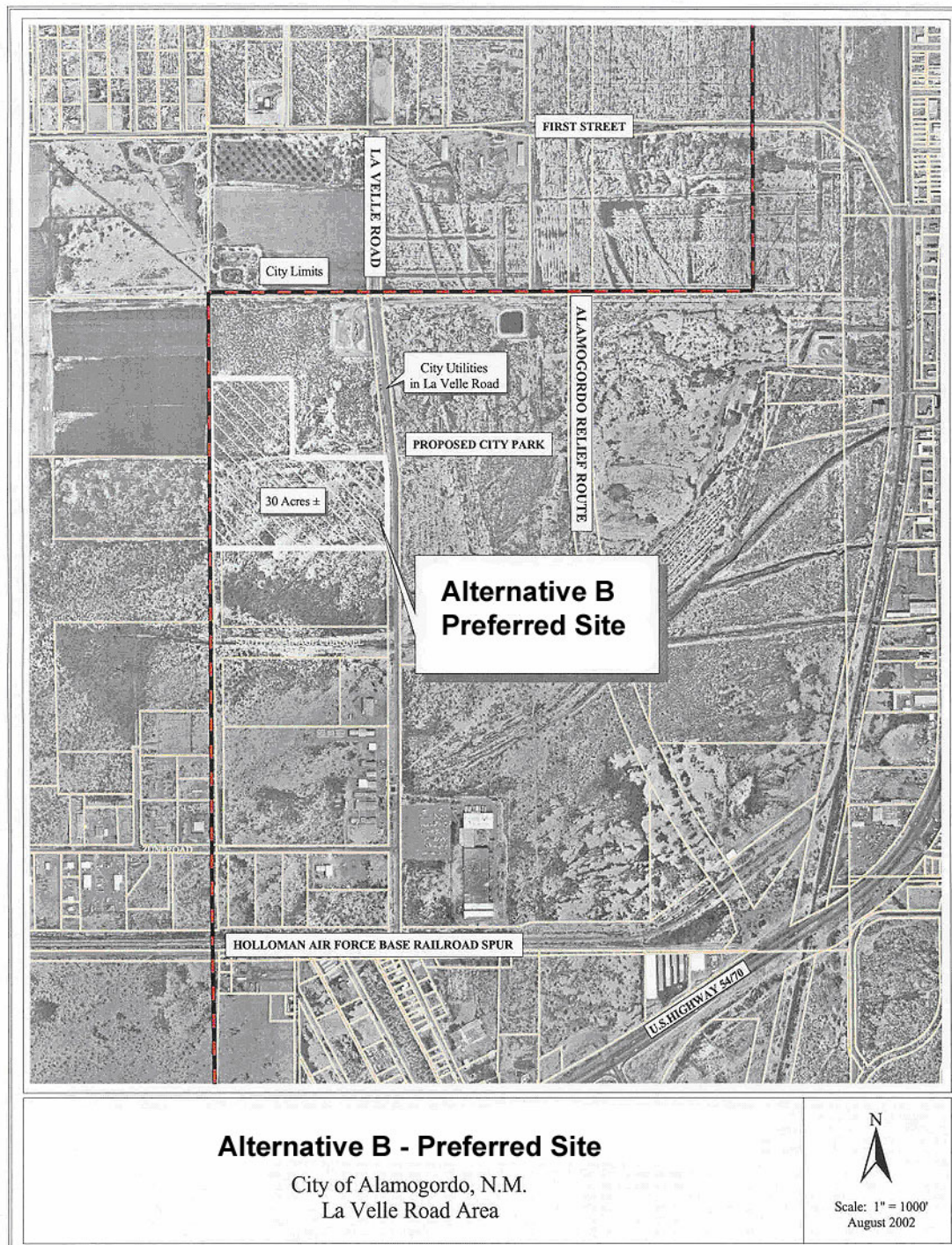


Figure 2-3.—Preferred facility location.

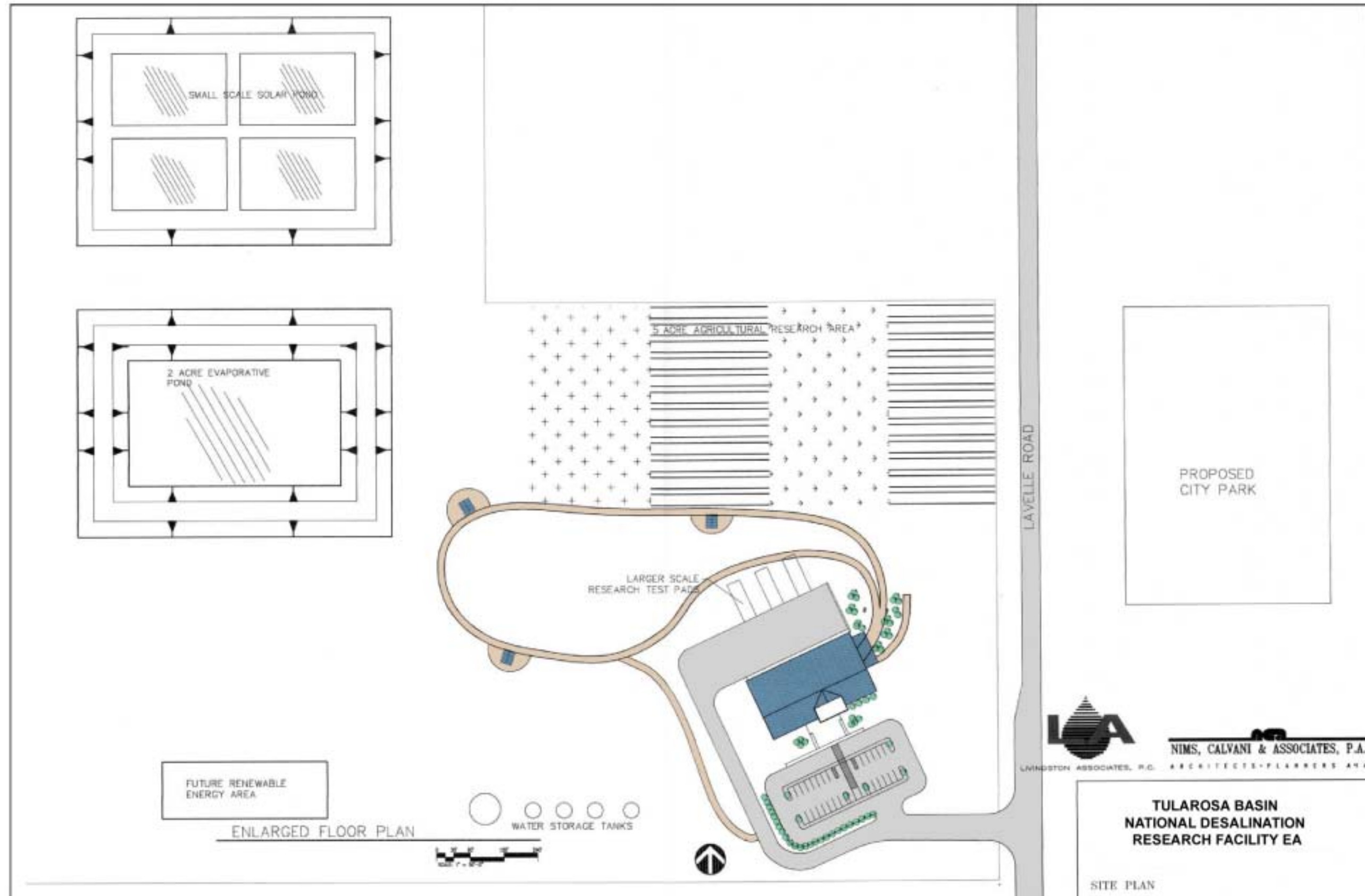


Figure 2-4.—Tularosa Basin Desalination Research Facility Study site plan.

Description of Alternatives

- ❖ Storage space to include pre- and post-treatment water storage, below grade piping. Piping to each bay is to be designed for up to 30-gallons-per-minute (gpm) pilot system design.
- ❖ Room for equipment maintenance, pilot system repair and refurbishment, chemical storage, etc.
- ❖ Pipelines and pumps from multiple wells to the facility to handle nominally 100-gpm flows and up to 150 gpm, providing a range of water qualities.
- ❖ Areas for evaluation of concentrate reuse for agricultural products, wetlands, etc., and
- ❖ Concentrate management research capabilities including evaporation pond(s), solar ponds, and a possible concentrate disposal well.

The actual building would be approximately 13,000 square feet. The facility design calls for a passive-solar building housing a high bay research area, water laboratory, control room, office space for permanent staff and visiting researchers, and a resource area and learning center for visitors. Desalination research areas would be provided for up to five 30-gpm pilot desalination technologies at a time and one fully operational desalination system for tours and facility water. Areas would also be provided for bench-scale research systems and outdoor pads available for larger-scale demonstrations. A split-level design would provide a one-story office suite in front of a high bay test area. This allows clerestory windows in the high bay to enable direct day lighting in the high bay research area and reduce energy costs. The one-story office area allows the use of photovoltaic shingles across the front of the building to provide power for the facility if needed; this type of renewable application will be evaluated in final design. The split-level design allows for insulation of parts of the building and provides a natural observation area for the test bays. The floor plan was also developed to facilitate routing of self-guided tours of the facility while protecting tour participants and keeping them from coming into direct contact with the research areas. The facility would also have a heat pump cooling and heating system.

Management and Operational Concepts

The following management and operational criteria are suggested to provide the flexibility needed to enable the facility to become a respected international research center and include:

- ❖ Federal facility operations oversight would be provided by an Executive Committee consisting of Reclamation and Sandia in conjunction with members composed of regional and national desalination and water resources professionals to insure appropriate research and development direction.
- ❖ Daily management and technical support would be provided by a technical services contractor, preferably with experience working in the local area and providing technical

- services in the White Sands, Holloman, Las Cruces, Ft. Bliss areas. Technical support and operation services would include technology testing, water analysis, tour scheduling, facility upkeep and maintenance, administrative functions, etc.
- ❖ Testing and evaluation schedules, cost/performance evaluation reports, progress reporting, etc., would be developed and reviewed by the executive board and a technical review board consisting of Reclamation, Sandia, and others.

WELLS AND PIPELINES

Test wells and pipelines would be located off-site of the Research Facility. A general location for the wells and pipelines, along with the three alternative sites, is shown in figure 2-5. Exploratory drilling will be used to determine the actual well locations. An environmental review of the well sites and pipeline locations would be conducted prior to construction. Based on this review, Reclamation would conduct the procedures under NEPA and environmental consultations, as appropriate.

Table 2-2 provides a brief description of the impacts of each action alternative as compared to the No Action Alternative. These impacts, as well as the affected environment, are described in more detail in chapter 3.

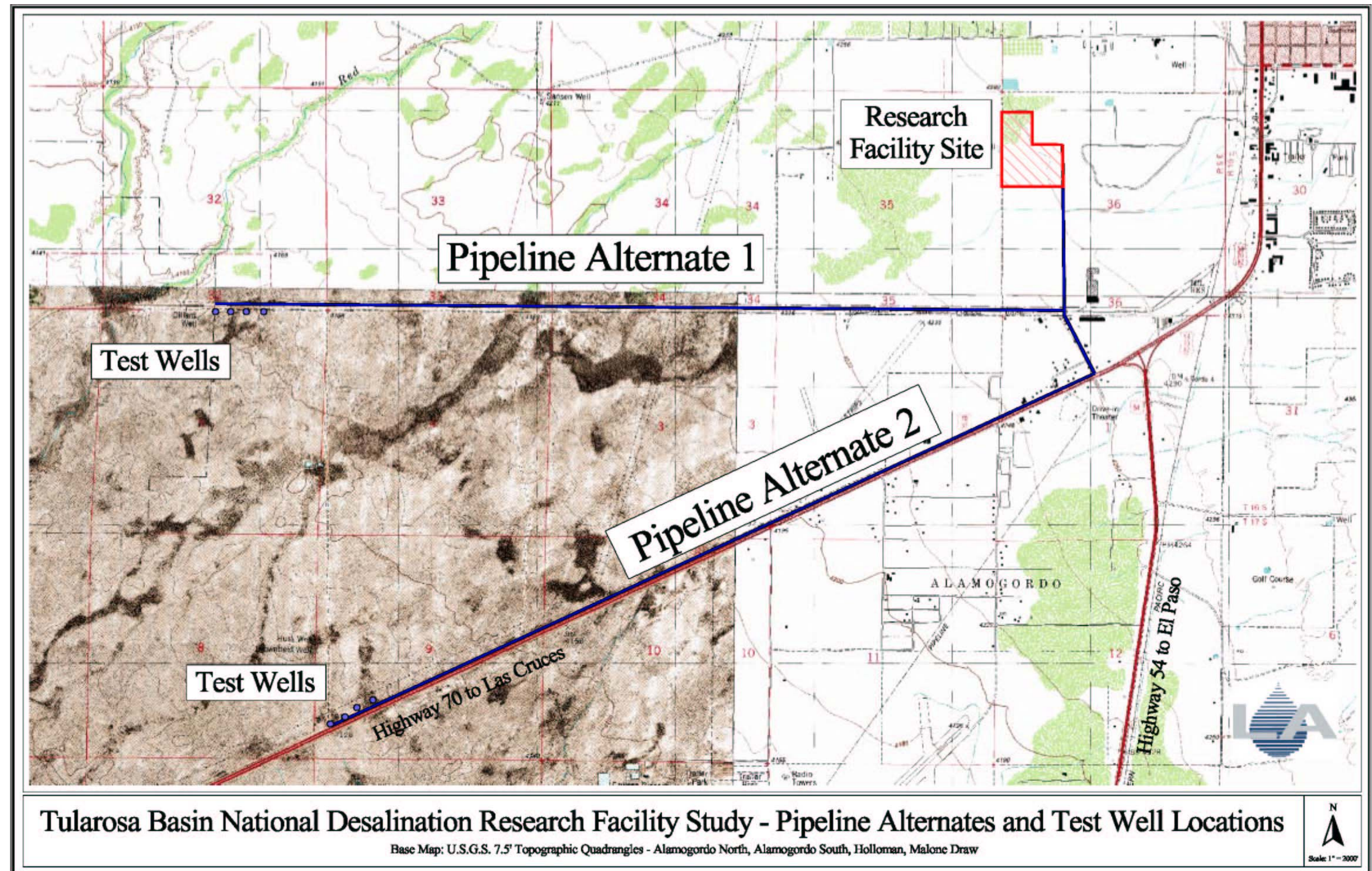


Figure 2-5.—Tularosa Basin National Desalination Research Facility Study - pipeline alternates and test well locations.

Table 2-2.—Comparison of Environmental Effects by Alternatives

Resource	Environmental Effect			
	Alternative A No Action	Alternative B Preferred Alternative	Alternative C	Alternative D
Ground Water Hydrology and Quality	No change from affected environment	Potential minor impact	Potential minor impact	Potential minor impact
Cultural Resources	No change from affected environment	No impact	No impact	No impact
Indian Trust Assets	No change from affected environment	No impact	No impact	No impact
Vegetation	No change from affected environment	Minor impact	Minor impact	Minor impact
Wildlife	No change from affected environment	Minor impact	Minor impact	Minor impact
Threatened and Endangered Species	No change from affected environment	No impact	No impact	No impact
Air Quality	No change from affected environment	Temporary minor impact	Temporary minor impact	Temporary minor impact

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter describes the affected environment and evaluates the environmental consequences of implementing the action alternatives described in chapter 2. This chapter also describes the No Action Alternative, which consists of the conditions of the resources that are anticipated to occur if Reclamation decides not to select an action alternative. Each of the action alternatives is similar in regard to the construction of the Research Facility. The Research Facility operation would also be similar in each of the alternatives, although the different locations of the alternatives may result in minor operational differences.

The environmental resources evaluated for each of the alternatives are listed below, in order of appearance in this chapter.

- ❖ Ground water hydrology and quality
- ❖ Cultural resources
- ❖ Indian Trust Assets
- ❖ Vegetation
- ❖ Wildlife
- ❖ Threatened and endangered species
- ❖ Air quality

RESOURCES NOT AFFECTED BY THE ALTERNATIVES

The action alternatives would not result in any legible impact on regional or local climatic conditions, soils, geology, surface water, topography, traditional cultural properties, fisheries, land use, recreation, paleontology, noise sensitive areas, sacred sites, social conditions, or minority and low-income populations and communities in the area. Therefore, these resources are not discussed further in the EA.

DESCRIPTION OF ACTIVITIES

Both the operation and construction of the proposed Research Facility have the potential to impact the environment, so both of these activities are evaluated in this chapter. Potential operational impacts would occur through activities such as pumping the ground water and disposal of the concentrate. Construction activities with potential impacts include earthwork for evaporation ponds, trenching for building foundations and utilities, vegetation removal and site clearing and grubbing, grading for drainage control, and trenching for piping from the test wells.

Because the proposed Research Facility would be constructed and operated in the same manner, no matter which action alternative site is selected, and because the environmental conditions at each of the three alternative sites are similar, the potential impacts for each of the sites would be similar under most of the resources. In these cases, the impacts are described under one heading, "Impacts Common to All Action Alternatives."

Pipelines and wells would also be constructed as part of the proposed project. The actual location of the wells and pipelines has not been determined at this point. This EA assumes that wells and pipelines would be located within the alignment for Pipeline Alternate 1 or 2 as shown in figure 2-5. Both of these alignments are located in disturbed railroad or highway rights-of-way. However, an environmental review of the final plans for the well sites and pipeline locations would be conducted prior to construction of the wells and pipelines. Based on this review, Reclamation would determine the need for and the level of further environmental compliance. If necessary, Reclamation would prepare a supplement to this EA.

OPERATIONAL IMPACTS OF THE DESALTING SYSTEMS

The purpose of the Research Facility is to investigate desalination and water purification technologies involving pressure, thermal, electrical, and ultrasonic driving forces, as well as future innovations in the desalting industry.

Various qualities of well water will be imported from off-site wells. The conveyance lines will consist of pressure pipe rated at pressures that far exceed the expected internal pressures produced by the supply wells.

All domestic waste will be discharged through the wastewater service connection to the city of Alamogordo wastewater collection and treatment system. Concentrate from the desalting pilot plants can be routed to the solar ponds for evaporation, discharged to the concentrate holding ponds for reuse in the Research Facility, discharged as wastewater to the City, or discharged to the City reuse line located in the vicinity of the site. The discharge of concentrate can range from 20 to 90 gallons per minute.

The Research Facility will be capable of discharging all concentrate to the City sewer system if the concentrate is not required for onsite research. If the Research Facility discharges concentrate or product water to the city of Alamogordo's wastewater or water reuse system; the quality, quantity, and timing of the discharge will be coordinated with the City.

Almost all chemicals used in desalting and pretreatment will be certified by the National Science Foundation for use as direct or indirect drinking water additives. If the chemicals are spilled or dumped into floor drains, they will not have a significant adverse effect on the quality of wastewater discharged from the Research Facility.

GROUND WATER HYDROLOGY AND QUALITY

Affected Environment

The source of all ground water in the Tularosa Basin is precipitation. The primary area of ground water recharge within the area is the fairly permeable alluvial fan material along the base of the Sacramento Mountains at the western edge of Alamogordo. Relatively little recharge occurs in the valley floor which consists of impermeable clay, silt, and evaporite deposits. The majority of ground water in the basin is drawn from underlying fill material, which is quite thin along the margins but increases to several thousand feet in thickness in the center of the valley. The ground water flows south through the basin, eventually reaching the Rio Grande Valley near El Paso, Texas.

Most of the ground water in the Tularosa Basin is of poor quality. An estimated 98 percent of the basin's ground water is classified as saline, having a dissolved solid concentration in excess of 35,000 milligrams per liter (mg/L), which is comparable to seawater salinity levels. High quality freshwater occurs along the base of the Sacramento Mountain range at the eastern edge of the basin and the western edge near Tat the Organ and San Andres Mountains. As ground water moves from the margins of the basin into its center, quality deteriorates significantly due to accumulated salts and dissolved solids.

Environmental Consequences

Alternative A – No Action

Ground water hydrology and quality would be expected to remain unchanged from the conditions discussed above in "Affected Environment."

Impacts Common to All Action Alternatives

Ground water hydrology would not be affected by any of the action alternatives.

Operation of the Research Facility would require some drawdown in the local water table due to pumping the test wells. Such drawdown would be within the New Mexico Office of the State Engineer allowable criteria. The water table would be monitored during

operations, and pumping reports would be submitted to the New Mexico Office of the State Engineer. The office of the State Engineer was represented on the Executive Committee and provided guidance regarding permitting.

Groundwater extraction rates will not exceed the natural recharge rates of the groundwater “reservoir,” resulting in no long-term impact on regional groundwater.

Several permits would be required to construct and operate the wells. Compliance with the permits, along with any required conditions, would help to eliminate or reduce the level of impact to the ground water. Several of the required permits are shown below in table 3-1.

Table 3-1.—Required Permits

Permit Purpose	Permit Information
Drilling	Exploratory well drilling permit New Mexico Office of the State Engineer Used to drill the test wells and determine the required depth of pumping
Test-well pumping	Application to appropriate ground water New Mexico Office of the State Engineer Used to obtain “water rights” for pumping.
Concentrate disposal	Ground water discharge permit New Mexico Environment Department, Ground Water section Used for deep well injection of the concentrate
Evaporation ponds	Ground water discharge permit New Mexico Environment Department, Ground Water section Used for evaporation of the concentrate in lined ponds

Mitigation

Permits and approvals required for specific construction activities and operation of the project would be received prior to commencement of construction.

CULTURAL RESOURCES

Affected Environment

Cultural resources include archaeological sites, historic features, traditional cultural properties, and Native American sacred sites. A traditional cultural property is “one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community’s history, and (b) are important in maintaining the continuing cultural identity of the community” (Parker and King, 1992:1).

The Tularosa Basin of south-central New Mexico has been inhabited for at least the past 10,000 years, since Paleo-Indian times. Evidence of human occupation in the basin often takes the form of scatters of fire-cracked rock, caliche, and stone tool manufacturing debris. The human adaptation in this area appears to have consisted of mobile hunting

Affected Environment and Environmental Consequences

and gathering. The known prehistoric sites in the vicinity of the proposed Research Facility locations are fire-cracked and burned caliche scatters with stone tool manufacturing debris.

Several large-scale archaeological surveys have been conducted in the general area of Alamogordo, including the Border Star 1985 survey to the southwest (Seaman, Doleman, and Chapman, 1988) and inventories and other projects in the southern Tularosa Basin and at White Sands Missile Range and White Sands National Monument (e.g., Beckes, 1977; Eidenbach, 1983; Eidenbach and Wimberly, 1980; Oakes, 1981). An overview of the prehistory of the Alamogordo area can be found in these volumes.

The city of Alamogordo was founded in 1898 as a railroad town. Historic activities in the area prior to that time consisted of farming and ranching. Military bases were established nearby in the World War II era, giving the area an economic boost. An overview of the early history of Alamogordo can be found in Myrick (1990). The historic sites in the vicinity of the Research Facility locations appear to be related to the early settlement of Alamogordo. The western margin of the Alamogordo settlement historically was favored for trash dumping since the territorial era in the late 1800s. This area is presently the location of light industry and the municipal trash transfer station.

The western edge of the Alamogordo area and the area between Alamogordo and Holloman AFB headquarters is developing as a light industrial area and a transportation corridor with gas stations and small businesses. The area west of the present city limits apparently was used for ranching prior to this development, and some areas still clearly support grazing.

A cultural resources inventory of the three proposed locations for the Research Facility was conducted in September and October 2002 (Larralde, 2002). Two archaeological sites were documented—one at the private land location and one at the City land location. The site at the private land location is a historic artifact scatter with a cistern, dating to about 1900-1920. The second site is an abandoned irrigation ditch dating from 1948 to 1975 that crosses the City land location. The only evidence of prehistoric use of the three inventoried locations is two brownware potsherds found on the State land location.

Environmental Consequences

Alternative A – No Action

Present land use practices are not expected to affect any significant cultural resources.

Alternative B – Preferred Alternative

There is an abandoned irrigation ditch on the site. The ditch or its location are not recommended eligible for nomination to the National Register of Historic Places and, therefore, need not be avoided or studied further should this location be chosen for

construction of the Research Facility. Therefore, selection of this alternative for construction and operation of the Research Facility would not affect significant cultural resources.

Alternative C

No archaeological or historic sites were found on this location. Therefore, selection of this alternative would not affect significant cultural resources.

Alternative D

A historic artifact scatter with a cistern was recorded adjacent to the private land location. Only a small portion of the scatter extends onto the location; most of the scatter is located on adjacent private land. Because the artifacts within this alternative were documented during the inventory, construction of the Research Facility on this alternative site would not affect significant cultural resources.

Consultation

Reclamation initiated consultation with the New Mexico State Historic Preservation Office (SHPO) in a letter dated October 31, 2002. The letter discussed the potential effects to cultural resources from construction of the Research Facility at the three proposed locations. Also included in the letter was Reclamation's recommendation that the construction of the project at any of the three alternative sites would not affect historic properties.

On November 11, 2002, the SHPO provided a response indicating that it concurred with Reclamation's recommendation, with one condition. If Alternative D was selected, the SHPO requested fencing along the site boundary in the area of the cistern. The fencing would protect the site from construction impacts.

Reclamation also consulted with the Mescalero Apache Tribe, the Pueblo of Isleta, and the Pueblo of Ysleta del Sur regarding the proposed project. Reclamation received no written responses from them. Reclamation's Cultural Resources Specialist of Reclamation's Albuquerque Area Office met with the Mescalero Apache Tribal Historic Preservation Officer on September 16, 2002, to discuss the three alternative sites. At that time, the Mescalero Apache Tribal Historic Preservation Officer said that she would like to be informed if prehistoric cultural materials were found during construction activities.

Mitigation

- ❖ If an action alternative is selected, Reclamation would ensure that the following language be included as specifications in the construction contract.

“If cultural resources are discovered during construction, work in the immediate area would cease until a Reclamation archaeologist evaluates the

site and takes appropriate measures. If the contractor or others inadvertently discover human remains during construction, work in the immediate vicinity of the discovery would cease, except to secure and protect the remains. A Reclamation archaeologist and appropriate law enforcement authorities would be contacted to help determine antiquity and manner of death. In cases where human remains are clearly from an archaeological context, procedures would be initiated in accordance with the Native American Graves Protection and Repatriation Act.”

- ❖ If prehistoric cultural materials are found during construction, Reclamation will contact the Mescalero Apache Tribal Historic Preservation Officer.
- ❖ If Alternative D is selected, Reclamation will fence the site boundary, as determined by a qualified archaeologist, prior to any clearing to prevent impact to the cistern and scatter site.

INDIAN TRUST ASSETS

Affected Environment

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for the benefit of Indian tribes or individuals. The United States has a trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or Indian individuals by treaties, statutes, and Executive orders. No Indian reservations or public domain allotments exist on the three proposed Research Facility locations. No Indian Trust Assets are known to exist in the project area.

Environmental Consequences

Alternative A – No Action

Present land-use practices are not expected to affect Indian Trust Assets.

Impacts Common to All Action Alternatives

The Mescalero Apache Tribe, the Pueblo of Isleta, and the Pueblo of Ysleta del Sur were consulted about ITAs; no concerns were raised. The appropriate Bureau of Indian Affairs offices were also contacted. Reclamation received no written responses from them. Therefore, Indian Trust Assets should not be adversely impacted by the selection of any of the action alternatives.

VEGETATION

Affected Environment

Plant Community

The project study area is located west of Alamogordo in south-central New Mexico. The area is arid and supports predominantly Chihuahuan Desert scrubland vegetation. The most common woody species throughout the project area are Torrey mesquite and creosote bush. The density and abundance of secondary shrubs and herbaceous species mesquite/ creosote overstory varies depending on soil conditions. The finer and often gypseous soils west of Alamogordo include grasses such as dropseed, fluff grass, munroa, purple-awn, black grama, alkali sacaton, panicum, burro grass, saltbush, and iodine bush. Seed mixtures of alkali cactus (*Sporobolus airoides*) and Wright's dropseed (*S. Wrightii*) should be used for revegetation. Both of these species are bunch grasses.

Introduced and Noxious Weeds

Several introduced and noxious weeds occur in the study area, including African rue and Russian knapweed. African rue is an introduced species from North Africa that has invaded thousands of acres on the missile range and Holloman AFB. This species is extremely drought tolerant and tolerate of saline and alkaline soils. It contains allelopathic chemical compounds that retard and prevent growth of native species, displacing native plants and establishing dominant stands. African rue is difficult to eradicate; and, once established, it interferes with the maintenance of healthy and diverse ecosystems by providing lower value to wildlife for cover and nesting habitat.

Environmental Consequences

Alternative A – No Action

Continuation of current land-use practices in the areas of the action alternatives are not expected to result in changes to the existing vegetation.

Impacts Common to All Action Alternatives

Construction of the proposed project would require clearing approximately 20 acres. The type of habitat that would be cleared for the construction and operation of the proposed project is common throughout the local area. While the permanent loss of vegetation would occur, the impact to the local area would be negligible due to the overall abundance of the habitat type. Areas that would be temporarily cleared would be vulnerable to colonization by introduced noxious weeds. These impacts would be eliminated or greatly reduced through proper revegetation efforts. Re-vegetation with native grasses will be used on disturbed areas where other surface treatment is not used.

Mitigation Measures

Construction specifications would require contractors to preserve the natural landscape and prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the work vicinity. All trees, shrubs and other vegetation would be preserved and protected from construction operations and equipment except where clearing operations are required for permanent structures, approved roads, or excavation operations. All maintenance yards, field offices, and staging areas would be arranged to preserve vegetation to the maximum practicable extent, and all disturbed areas would be reclaimed.

Upon completion of construction, any land disturbed but not permanently occupied by new facilities would be graded to provide proper drainage and to blend with the natural contours of the land.

Local native species would be used for revegetation of temporarily cleared areas. These revegetation efforts will be used to prevent noxious weeds from invading the area.

WILDLIFE

Affected Environment

Wildlife in the project area consists of species common to the desert scrub plant communities. Several of the species commonly found in this habitat are listed in table 3-2.

Table 3-2.—Wildlife Species Commonly Found in the Project Area

Mammals	Reptiles	Birds
White-tailed antelope	Chihuian spotted whiptail	Black-throated sparrow
Ground squirrel	New Mexican whiptail	Mourning dove
Coyote	Desert grassland whiptail	Greater roadrunner
Black-tailed jackrabbit	Greater earless lizard	Cactus wren
White-footed mouse	Texas horned lizard	Turkey vulture
Botta's pocket gopher	Gopher snake	American kestrel
Striped skunk	Western diamondback rattlesnake	Western kingbird

Environmental Consequences

Alternative A - No Action

Current land-use activities in the areas of Alternatives B, C, and D are not anticipated to impact wildlife or available habitat.

Impacts Common to All Action Alternatives

Construction activities would most likely result in wildlife species avoiding the immediate and adjacent area. However, these temporary impacts would cease once construction is complete.

Up to 30 acres of potential wildlife habitat would be permanently cleared and replaced by buildings, ponds, and other structures. However, this type of wildlife habitat is relatively abundant in the project area, and the loss of up to 30 acres would not be a significant effect on wildlife.

The presence of the concentrate disposal ponds could be an attraction for waterfowl. However, the ponds will be lined, and this would prevent the establishment of a food base that would encourage waterfowl to remain at the ponds for an extended period of time. The lack of a food base for waterfowl should reduce the risks of cumulative uptake of the salts in the concentrate disposal ponds.

Mitigation Measures

If the constructed concentrate solar ponds become an attraction to waterfowl, an ultrasonic bird repeller system will be installed around the ponds. In a worst-case scenario, floating plastic balls will be added to cover the surface of the water to minimize the attractiveness of the ponds to waterfowl.

THREATENED AND ENDANGERED SPECIES

Affected Environment

In accordance with section 7(a) (2) of the Endangered Species Act of 1973, as amended, and its implementing regulations under 50 CFR 402, Reclamation requested from the Service a list of federally listed and proposed threatened or endangered species within the Research Facility project area. On August 4, 2002, the Service provided a list of threatened and endangered species that may occur in Otero County. The list included the following species and their Federal status (table 3-3).

Table 3-3.—Federally Listed and Proposed Species

Species	Status
Black-footed ferret	Endangered
Interior least tern	Endangered
Northern aplomado falcon	Endangered
Southwestern willow flycatcher	Endangered
Kuenzler hedgehog cactus	Endangered
Sacramento prickly poppy	Endangered
Todsen's pennyroyal	Endangered
Sacramento Mountains checkerspot butterfly	Proposed endangered
Bald eagle	Threatened
Mexican spotted owl	Threatened
Sacramento Mountains thistle	Threatened
Mountain plover	Threatened

Environmental Consequences

Alternative A – No Action

Current land-use practices at alternative sites B, C, and D should not impact federally listed or proposed threatened species.

Impacts Common to All Action Alternatives

The proposed construction and operation of the Research Facility would not occur within the known habitat of any federally listed or proposed threatened or endangered species. Reclamation concluded that this action has no potential to jeopardize the continued existence of any federally listed or proposed threatened or endangered species or results in the destruction or adverse modification of critical habitat proposed to be designated for such species.

AIR QUALITY

Affected Environment

Otero County (County) is within the State of New Mexico's Air Quality Control Region 6. The County is in attainment status for National Air Quality Standards for priority pollutants (particulate matter, sulfur oxides, nitrogen dioxide, carbon monoxide, ozone, and lead), and the ambient air quality meets or exceeds Federal and State standards. Generally, the only pollutant of any concern in the area is particulate matter.

(blowing dust during periods of high winds). The New Mexico Environment Department has designated the project area as Class II, which allows for moderated development and its associated air emissions. The nearest designated Class I area, which is the most pristine air quality designation, is the White Mountain Wilderness Area, approximately 35 miles north of Alamogordo.

Environmental Consequences

Alternative A – No Action

Land use in the area of the action alternatives is not expected to impact air quality.

Impacts Common to All Action Alternatives

Clearing and other construction activities would result in temporary increased levels of dust and dirt in the air. Air pollution impacts associated with the construction and operation of all action alternatives would be temporary, localized, and of small magnitude. There would be no net adverse impact on air quality or ambient air quality standards in the project area, especially with the application of the mitigation measures shown below. Overall, it is expected that diminished air quality during construction and operation of the Research Facility would have no effect on human health.

Depending upon the type of research, operational impacts could result in odors being generated. Research conducted outside of the Research Facility, such as active and passive concentrate evaporation research that involves the ponds or other techniques may produce odors. As shown in figure 2-5, the preferred site location is over a mile from any residential area. With this and with the relatively smaller nature of research projects, it is not anticipated that adverse odors will affect local residents.

Mitigation Measures

Air quality control measures would be included in the Research Facility's construction specifications. Standard measures would require contractors to reduce dust from construction activities. These measures would include periodic wetting of exposed soils or roads where dust is generated by passing vehicles. Burning materials from clearing of vegetation, combustible construction materials, and trash would be permitted only when atmospheric conditions are considered favorable by appropriate State or local air pollution or fire authorities. Where open burning is permitted, burn piles would be constructed to reduce smoke, and under no circumstances would the contractor burn unapproved materials such as tires, plastics, rubber or asphalt products, or other materials that create heavy, black smoke or nuisance odors.

CONSULTATION AND COORDINATION

PUBLIC SCOPING AND INVOLVEMENT

An early public and agency scoping process identified the issues to be addressed in the draft EA. Information was gathered through meetings and discussions with key stakeholders, local, and State and Federal agency personnel. Reclamation also conducted site visits, surveys, and consulted with the U.S. Fish and Wildlife Service and the State Historic Preservation Office.

The draft EA and draft FONSI were distributed by memorandum dated May 29, 2003, for a 30-day public review and comment period (See Appendix B). The comment period ended June 30, 2003. A complete distribution list is available upon request. A formal news release was issued by Reclamation announcing the availability of the draft EA and draft FONSI and also announcing a public meeting to discuss the draft EA. The public meeting was held in Alamogordo, New Mexico, on June 24, 2003, at 7:30 p.m. in conjunction with the City Commissioner's meeting. Notice of the meeting to discuss the draft EA was also included on the City Commissioner's published agenda. The public meeting was attended by approximately 65 people.

Based on the discussion at the public meeting, a statement was added to Chapter 3, "Operational Impacts of the Desalting Systems," clarifying that if the Research Facility were to discharge to the City of Alamogordo's wastewater or water reuse systems, the quality, quantity, and timing of the discharge would be coordinated with the City. No additional environmental issues or concerns were raised at the public meeting or during the public review and comment period regarding the construction or operation on the Research Facility. The only written comment received was a "No Comment" response from the New Mexico State Historic Preservation Office.

AGENCY COORDINATION AND CONSULTATION

U.S. FISH AND WILDLIFE SERVICE

Endangered Species Act

In accordance with Section 7(a) of the Endangered Species Act of 1973 and its implementing regulations under 50 CFR 402, Reclamation requested from the Service information on the listed and proposed-to-be-listed threatened and endangered species that may be located in the project area. The Service provided the list as shown in chapter 3. Reclamation concluded that this action has no potential to jeopardize the continued existence of any federally listed or proposed threatened or endangered species or results in the destruction or adverse modification of critical habitat proposed to be designated for such species.

National Historic Preservation Act

Reclamation consulted with the New Mexico State Historic Preservation Office to discuss potential effects to cultural resources from construction of the Research Facility at the three proposed locations.

On November 11, 2002, the SHPO provided a response indicating that it concurred with Reclamation's recommendation, with one condition. If Alternative D was selected, the SHPO requested fencing along the site boundary in the area of the cistern. The fencing would protect the site from construction impacts.

Reclamation also consulted with the Mescalero Apache Tribe, the Pueblo of Isleta, and the Pueblo of Ysleta del Sur regarding the proposed project. Reclamation received no written responses from them. Reclamation met with the Mescalero Apache Tribal Historic Preservation Officer, on September 16, 2002, to discuss the three alternative sites. At that time, the Mescalero Apache Tribal Historic Preservation Officer indicated that she would like to be informed if prehistoric cultural materials were found at any of the three locations during construction activities.

LIST OF PREPARERS

Name	Title	Area of Involvement
Patty Alexander	Editor Bureau of Reclamation	Editing and Desktop Publishing
Del Holz	Manager, Resource Management and Planning Group Bureau of Reclamation	Environmental Compliance and Planning
Steve Finch	Senior Hydrogeologist-Geochemist John Shomaker & Associates, Inc.	Groundwater Hydrology and Quality
Kurt Flynn	Resource Manager Bureau of Reclamation	Vegetation, Fish, Wildlife Endangered and Threatened Species, Air Quality
Thomas Jennings	Manager, Desalination and Water Purification Research and Development Program Bureau of Reclamation	Research Process
Signa Larralde	Archeologist Bureau of Reclamation	Cultural Resources, Indian Trust Assets

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MITIGATION

All of the mitigation included in the proposed action is identified below.

ALL RESOURCES

- ❖ The actual location of the wells and pipelines has not been determined at this point. Therefore, an environmental review of the plans for the well sites and pipeline locations would be conducted prior to construction. Based on this review, Reclamation would follow procedures under the National Environmental Policy Act (NEPA) and conduct environmental consultations required by the National Historic Preservation Act and the Endangered Species Act, as appropriate.

GROUND WATER HYDROLOGY AND QUALITY

- ❖ Permits and approvals required for specific construction activities and operation of the project would be received prior to commencement of construction.

CULTURAL RESOURCES

- ❖ If an action alternative is selected, Reclamation would ensure that the following language be included as specifications in the construction contract.
- ❖ If cultural resources are discovered during construction, work in the immediate area would cease until a Reclamation archaeologist evaluates the site and takes appropriate measures. If the contractor or others inadvertently discover human remains during construction, work in the immediate vicinity of the discovery would cease, except to secure and protect the remains. A Reclamation archaeologist and appropriate law enforcement authorities would be contacted to help determine antiquity and manner of death. In cases where human remains are clearly from an archaeological context, procedures would be initiated in accordance with the Native American Graves Protection and Repatriation Act.
- ❖ If prehistoric cultural materials are found during construction, Reclamation will contact Ms. Donna McFadden, with the Mescalero Apache Tribal Historic Preservation Officer.
- ❖ If Alternative D is selected, Reclamation will fence the site boundary, as determined by a qualified archaeologist, prior to any clearing to prevent impact to the cistern and scatter site.

VEGETATION

- ❖ Construction specifications would require contractors to preserve the natural landscape and prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the work vicinity. All trees, shrubs and other vegetation would be preserved and protected from

- construction operations and equipment except where clearing operations are required for permanent structures, approved roads, or excavation operations. All maintenance yards, field offices, and staging areas would be arranged to preserve vegetation to the maximum practicable extent, and all disturbed areas would be reclaimed.
- ❖ Upon completion of construction, any land disturbed but not permanently occupied by new facilities would be graded to provide proper drainage and to blend with the natural contours of the land.
 - ❖ Local native species would be used for revegetation of temporarily cleared area. These revegetation efforts will be used to reduce the possibility of noxious weeds invading the area.
 - ❖ All permits and approvals required for construction and operation of the project would be received prior to commencement of clearing.

WILDLIFE

- ❖ If the constructed concentrate solar ponds become an attraction to waterfowl, an ultrasonic bird repeller system will be installed around the ponds. In a worst-case scenario, floating plastic balls will be added to cover the surface of the water to minimize the attractiveness of the ponds to waterfowl.

THREATENED AND ENDANGERED SPECIES

- ❖ New species may be proposed or added to the Federal list of species, or the status of the species included in table 3-3 of the environmental assessment may change over time. Therefore, approximately 90 days prior to beginning construction activities, the responsible lead Federal agency will make a new determination regarding the impacts of the proposed project in accordance with section 7(a)(2) of the Endangered Species Act.

AIR QUALITY

- ❖ Air quality control measures would be included in the Research Facility's construction specifications. Standard measures would require contractors to reduce dust from construction activities. These measures would include periodic wetting of exposed soils or roads where dust is generated by passing vehicles. Burning materials from clearing of vegetation, combustible construction materials, and trash would be permitted only when atmospheric conditions are considered favorable by appropriate State or local air pollution or fire authorities. Where open burning is permitted, burn piles would be constructed to reduce smoke; and under no circumstances would the contractor burn unapproved materials such as tires, plastics, rubber or asphalt products, or other materials that create heavy, black smoke or nuisance odors.

DISTRIBUTION LETTER



IN REPLY REFER TO:

W-9000
RES-3.00

United States Department of the Interior

BUREAU OF RECLAMATION
Washington, D. C. 20240

MAY 29 2003

MEMORANDUM

To : Interested Individuals, Organizations, and Agencies

From: Shannon Cunniff
Director, Research

Subject: Tularosa Basin Desalination Research Facility Draft Environmental Assessment

Enclosed for your information and review is a copy of the Draft Environmental Assessment for the Tularosa Basin Research Facility. The draft EA evaluated the impacts of constructing and operating the 30-acre Research Facility at three sites as well as the No Action Alternative. Construction and operation activities will have only potentially minor and, in some cases, temporary impacts on ground water quality, vegetation, wildlife, and air quality. There will be no impact on ground water hydrology, cultural resources, Indian Trust Assets, and threatened and endangered species. A copy of the draft Finding of No Significant Impact is enclosed with this memorandum.

Please send any comments you have to Del Holz, D-8550, Bureau of Reclamation, PO Box 25007, Denver CO 80225. Deadline for comments is June 30, 2003.

A public meeting will be held on June 24, 2003, in conjunction with the City of Alamagordo's Commissioners meeting at the City Building.

The draft EA will be posted on the Internet at www.usbr.gov/research.

Sincerely,

Shannon Cunniff
Director, Research

bc: W2000, W1125

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